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ABSTRACT

For more than 35 years the National Institute of Mental Health (NIMH) has been the nation's major instrument of support for research in mental health. The yield from this ongoing research effort has been substantial, with a substantive increase of information about the causes, treatment, and prevention of mental illness as well as the factors that help foster good mental health. The research has been marked by several trends including: (1) a shift away from oversimplified theories about the development of mental illness; (2) the importance of genetic factors and the effect of drugs on behavior; (3) methodological advances in quantifying observations and judgments of symptoms and behavior; (4) progress in the field of learning behavior; and (5) a focus on the family as a contributor to the development of mental disorders. (Author/HLM)

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Mental Health Is Served By Research

Dr. Boris Blai, Jr.

"Anyone whose life has been touched by emotional disturbance, not to mention the more acute and crippling mental problems, knows that mental health is the primary determinant of the quality of the life an individual leads. Many conditions influence our lives, but none so much as our psychological state. Since the mental outlook of a people will be reflected in their behavior" (1)... it is a matter of practical importance to seek a better understanding of mental health's various dimensions.

For more than 35 years the National Institute of Mental Health (NIMH) has been the nation's major instrument of support for research in mental health. The yield from this on-going research effort performed by or supported by NIMH has been substantial. There has been a substantive increase of information about the causes, treatment, and prevention of mental illness - as well as the factors that help foster mental health.

As detailed in this article (the substance of which is liberally drawn from the NIMH 1975 report entitled "Research In The Service of Mental Health), scientists in various fields of specialization have made significant progress toward the solution of a number of mental health problems. In addition, the results of research supported or conducted by the NIMH have been extensively utilized by mental health practitioners.

"The National Mental Health Act of 1946 authorized the establishment of NIMH with this statement of mission from Section 2:

> The purpose of this Act is the improvement of the mental health of the people of the United States through the conducting of researches, investigations, experiments, and demonstrations relating to the cause, diagnosis, and treatment of psychiatric disorders, assisting and fostering such research activities by public and private agencies and promoting the coordination of all such researches and activities and the useful application

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of their results; training personnel in matters relating to mental health; and developing, and assisting States in the use of, the most effective methods of prevention, diagnosis, and treatment of psychiatric disorders..

Though the program was authorized in 1946 .... it was April 1, 1949 that the Public Health Service Division of Mental Hygiene officially became the National Institute of Mental Health." (2)

The scope of the nation's mental health problems is evident in the estimate that no less than 10 percent of the United States population, or roughly 20 million people, suffer from some sort of mental illness. And of these troubled people, only about one-seventh (or 3 million) receive some form of psychiatric care.

The annual cost of mental illness, based upon the above figures, has been conservatively estimated at $21 billion; about one-quarter of the national defense budget. This cost estimate may, however, be low for other estimates put the economic cost of alcoholism at about $15 billion annually, and that of drug abuse at $10 billion.

Biological Bases for Behavior:

As Dr. Segal of NIMH has noted: "More has been learned about the brain in the last quarter century than in all previous history." From the standpoint of the rapidity with which basic discoveries can be clinically applied, two particular advances are especially significant. One is the discovery that information is transmitted through the brain and the rest of the nervous system by the release at nerve cell terminals of biochemicals called neurotransmitters: they bridge the gap between cells.

One of the neurotransmitters, norepinephrine, is now considered important (perhaps even crucial) in the functioning of regions of the brain believed to govern the emotions. Within very recent years, experiments have demonstrated that treatment for a major group of illnesses - depressive or affective disorders - has a marked effect upon norepinephrine. Apparently disparate modes of therapy

work to increase the supply of norepinephrine at neural transmission points. This finding is clearly important, both to understanding the depressive disorders and to treating them.

Clinical investigators at NIMH, and others, studying mechanisms by which psychotropic drugs act against another major group of mental illnesses, the schizophrenias, found that a key role goes to a brain chemical frequently identified as a neurotransmitter. It is dopomine, the precursor of norepinephrine; i.e., the substance from which it is constructed. Research has shown that lowering the level of dopamine, or otherwise blocking the dopamine effect, proved beneficial in the treatment of the schizophrenias.

The second significant advance has been the amassing of evidence that heredity plays an important role in abnormal, as well as normal, behavior. Research, much of it conducted or supported by NIMH, has demonstrated that heredity strongly influences susceptibility to schizophrenia. Scientists are adding to our knowledge of the role of heredity in depressive disorders as well. In the case of the manic-depressive psychosis, the incidence in the general population has been estimated at 0.7 percent, (in 1974). Among additional twins, however, the concordance rate was found to run from 50 to 100 percent.

Additionally, in certain types of mental retardation, researchers have uncovered the nature of the biological defect. In phenylketonuria (PKU), for example, retardation stems from the body's inability to convert the amino acid phenylaliamine to tyrosine. This inability results from the lack of a single enzyme whose production is controlled by a single gene.

Research has also found that genetically governed conditions may be far from incurable. Knowledge about inherited susceptibility can lead to precise forms of intervention and to prevention or treatment.

New findings about the brain's development and functioning have contributed to further understanding of biological influences on behavior. For

example, research has shown that the brain's 10 billion neurons are specialized by location, shape, and metabolism, by the population of other nerve cells with which they can directly communicate, and by the neurotransmitters they can manufacture and secrete. Each neuron also has receptors for specific hormones and neurotransmitters.

Other research over the past 30 years has demonstrated that the embryonic and developing brain is exceptionally vulnerable to environmental influence. Very young organisms, both human and animal, are affected by the lack of sensory experiences as well as of nutrition. Enrichment of the environment so that brain as well as body can be exercised leads in young rats both to a larger cortex and to an increased problem-solving ability.

Additionally, investigators have found a remarkable capacity of the developing brain to recover function after an injury. Brain scientists have discovered that when axons are damaged, remaining normal axons sprout collaterals which appear to occupy the sites formerly occupied by the injured axons.

Over the past quarter century, considerable research progress has been achieved in relating memory, learning, and other higher functions to particular brain processes. One line of research suggests that neurotransmitters may hold a vital role, for the concentration of brain neurotransmitters is higher in animals that have learned a certain response than those that have not. Other research has found that compounds known to interfere with the synthesis of protein interfere also with the memory process. Among many additional advances, the cortex of the frontal lobes, once considered to be simply the repository of general memories, can now be divided into several parts, each with its own function.

From the clinical point of view, increased understanding of operant conditioning learning, known as benavior therapy in its clinical application, ranks at the top in recent decades of psychological development. Norepinephine is

again involved, as is serotonin, another putative neurotransmitter. The latter seems to be involved in controlling the effectsof punishment rather than reward.

Studies of other brain systems have vastly expanded knowledge of the biological structures responsible for motivated behavior, for sleep and pain, for attention and perception, for the performance of motor skills, and for sexual, aggressive, and other social behavior. Abnormalities in the functioning of any of these structures may lead to behavioral abnormalities, including perhaps a mental illness.

Although the neurotransmitters that bridge a substantive percent of the synaptic clefts have not yet been identified, the depressive or affective disorders appear to be related to a shortage of the neurotransmitter norepinephine at brain synapses, while the schizophrenias appear to be related to the oversupply of the neurotransmitter dopamine.

Some Psychological Dimension of Behavior:

Psychological research is concerned with the processes of perceiving one's environment, responding to stimuli, learning, remembering, thinking, and the development of emotion, motivations, aspirations and values.

One of the greatest advances in the mental health field in recent times has been the development and application of learning theory. It ranks with the discovery of neurotransmitters and of drugs to treat schizophrenia and depression. Basic research on operant conditioning, associated most closely with the psychologist B.F.Skinner, has led to diverse applications. Under the name of behavior modification, the principles and techniques of conditioning have facilitated the teaching of mentally retarded persons, the removal of reading disabilities, and the correction of aberrant behavior. Operant conditioning applications, under the name of behavior therapy, are widely used in the treatment of mentally ill persons, including autistic children and schizophrenic adults.

"Behavior modification typically tries to influence behavior by changing the environment and the way people interact, rather than by intervening directly through medical procedures (such as drugs) or surgical procedures (such as psychosurgery). Thus, behavior modification methods can be used in a broad range of situations, including the child-rearing efforts of parents and the instructional activities of teachers, as well as the therapeutic efforts of mental health workers in treating more serious psychological and behavioral problems. The effects of behavioral modification, unlike the results of most surgical procedures, are relatively changeable and impermanent." (3)

Like any technology, behavior modification can be used ineptly, or for ends that could be considered immoral. However, as Skinner (1971) notes, the technology of behavior modification "is ethically neutral. It can be used by villian or saint." (4)

As Lovaas (1973) indicates, some autistic children, who might otherwise be continuously restrained in straight-jackets because of their attempts at severe self-mutilation, have been helped by properly designed programs to control their own behavior effectively.

Perhaps the finding with the greatest potential, from research in the learning field, is evidence that brain waves, heart rate, and other functions considered only a few years ago to be outside the range of voluntary control can in fact be controlled by the methods of operant conditioning.

Of the many advances in the field of social psychology during the past several decades, the most significant probably has been the demonstration of the importance of groups - including peer, work, ethnic, and the family - for the psychological functioning and mental health of the members.

Sociocultural Influences on Behavior:

It is a universal feature of social life that individuals acquire differ-

ential status, honor, and power; i.e.,that societies are stratified. How does the individual's location in the stratification system bear upon his psychological functioning - his personality, attitudes, emotions, values, orientations, mental health?

Over the past several decades evidence has accumulated that the individual's location in the stratification system bears strongly on his thoughts, dealings, and behavior. Research reveals similar relationships of class perceptions, attitudes, and values in all industrialized countries. Recent findings establish a prima facie case that men's social class position affects their values and orientations, at least in substantial part, because of class-related conditions in their occupational lives. The actual, specific work that members of different social classes tend to do, particularly the substantive complexity of their work with things, with data, and with people, has major effects on how they think, feel, and act.

Schizophrenia occurs most frequently at the lowest social class levels of urban society, according to evidence from research in Canada, Denmark, Finland, Great Britian, Norway, Sweden, Taiwan, and the United States. The evidence to date indicates that both social class and stress are probably involved in the etiology of schizophrenia, but that neither alone provides a sufficient explanation of the disorder. Genetic studies have demonstrated an inherited propensity or vulnerability, but this too, standing alone, is not enough.

In the area of contextual analysis, i.e., investigations in which the focus shifts from the individual to the environment within which individual behavior occurs, current studies of the families of psychiatric patients view psychopatholoy in the individual as a product of family process rather than of a process solely within the individual himself.

There are signs - such as the American exodus to the suburbs, high rates of crime, drug abuse, and mental illness - that man's adaptation to cities is

more successful at the physical than at the social and psychological level, and that as cities increase in size, adaptation becomes more difficult. This is a prospective problem of enormous scope because of the significance of the following demographic projections. In 1970 about 864 million people - 24 percent of the world's population - lived in 1777 cities of more than 100,000 inhabitants. By the end of the present century, if no major catastrophe intervenes, the population in such places is expected to be three times the 1970 figure. By then, about 40 percent of the human race will live in cities of 100,000 or more, and around 25 percent in cities of a million or more.

In the light of the trends revealed in this demographic analysis, on-going research dealing with the social problems and psychological stresses associated with urbanization becomes urgent.

Research on Child Mental Health:

A major key to adult adjustment and mental health lies in the events of childhood, a critical period in human development. Basic studies relevant to child mental health have provided new information of the role of heredity in mental illness. Additionally, such studies have resulted in a new understanding of psychological development during infancy and childhood, as well as a greater appreciation of social influences on the well-being of the child.

Learning disorders represent the major single cause of school dropouts, and constitute one of the major problems of children and young people who have been referred to clinics and juvenile courts. Among the probable causes of learning disorders, research over the past decade has pointed to genetic defects, prenatal and perinatal complications, postnatal brain trauma and infection, inadequate teaching, cultural deprivation, sensory defects, emotional problems, and the complexities of English spelling.

The category of anitsocial children includes a large portion of those called delinquent or predelinquent, hyperactive, or underachievers, as well as many

children with specific learning disabilities. A study by an English investigator found that of all children psychiatric disorders in his purview, antisocial behavior was the most common category. It accounted for two-thirds of all psychiatrically disturbed boys and one-third of psychiatrically disturbed girls in the sample studied.

An NIMH scientist studying hyperactive children has found a high incidence of minor physical anomalies suggestive of "chromosomal irregularities or some kind of insult affecting embryological development." And antisocial parents, whether natural or adoptive, are more likely to produce antisocial children than other parents. In addition, the development of antisocial behavior is also associated with negligent child-rearing practices and broken homes, especially those dominated by tension, neglect, and poverty. For such antisocial children, behavior modification techniques have been demonstrably effective in the short term, and a vocationally oriented psychotherapy program for deliquent boys yielded benefits which persisted for at least a decade.

The psychoses of childhood are often divided into three categories: (1) infantile autism; (2) the rarer ones, sometimes terms "disintegrative" or "regressive", that occur between the ages of 3 and 5 following a period of normal development; and (3) schizophrenia beginning later in childhoos.

Research regarding infantile autism strongly indicates that the symptoms are probably caused in large part by a cognitive, perceptual, or language deficit. Several investigators have found that at least a sizeable minority of autistic children have indications of some kind of organic brain dysfunction; applying only or mainly to autistic children with low I.Q's. The overall level of intelligence is normal in about one-fourth of such children; the others are mentally retarded to a greater of lesser degree.

Research has shown that behavior modification techniques can be very useful as a means both of treating autism and of investigating its nature.

Unfortunately, much of the research on childhood schizophrenia cannot be evaluated because the children studied were not clearly described. In many cases the groups appear to have been composed largely of autistic children.

Practically nothing is known about this rare group of "disintegrative" psychoses. Post-mortem studies have usually shown cortical degeneration, but these need to be repeated using modern histopathological techniques.

Mental Health and Aging:

A 12-year study by the NIMH of normal, healthy, aged men contradicted the popular view that the aging process is inevitably accompanied by great deterioration in psychological functioning. Numerous other studies have uncovered behavioral impairment in old people, and found it to be related to isolation, lonliness, and feelings of uselessness.

As individuals grow older, they show a slower reaction time as they respond to signals in their environment. Compared with younger people, older people have difficulty storing information so that they can retrieve it readily.

Most particularly, elderly people are susceptible to organic psychosis (sometimes called organic brain syndrome), and depression. For most senile and presenile psychoses, no effective drug or other organic therapy exists.

For patients suffering from depressive psychosis, when treated with antidepressant drugs, electric shock, and lithium carbonate, all of these prove effective in approximately 80 percent of the patients who receive them.

Alcohol and Drug Abuse:

Alcohol has long been recognized as the nation's No. 1 drug abuse problem. In a report to Congress, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) estimated that 9 million persons were alcoholics or abusers of alcohol. Some 30 percent of the brothers and fathers of alcoholic persons are alcoholics themselves and at least a fifth of the children of alcoholic persons develop

alcoholism as adults. Alcoholism apparently 'runs in families' but it is difficult to distinguish between genetic and environmental factors; to-date, the evidence for a genetic basis for alcoholism is not conclusive.

The National Institute on Drug Abuse, established first in 1967 as the NIMH Center for Studies of Narcotic and Drug Abuse, has conducted epidemiological studies to give a rounded picture of the drug abuse problem. It is estimated that at least half a million people in the United States are opiate users and addicts, the opiate generally being heroin. It has also been estimated that in excess of 25 million Americans have used the drug marihuana. Other hallucinogens and stimulant drugs have been abusively used at various times.

Psychosocial research points to the possibility that the amphetimes (the stimulant drugs), along with the opiates, are particularly attractive to psychopathic individuals. Regarding depressants, research conducted or sponsored by the NIMH has demonstrated that the sedative effects of these drugs probably results mainly from depressant action on the midbrain reticular activating system, and that overdose desths result from depression of the brain's respiratory center and of the cough and swallowing reflexes. Continued abuse of either the barbituated or alcohol leads to addition.

Research on Mental Disorder/Emotional Disturbances Treatment:

The research on treatment of mental disorders and emotional disturbances has been conducted in three broad areas: psychosocial treatment; behavior therapy; somatic therapy. "During the last 25 years, NIMH-supported research has developed, tested, and refined new and powerful treatments effective for a wide spectrum of emotional disorders. The techniques include cemotherapy, behavior therapy and physical manipulation. The advances have occured in the context of a field in flux - a field stimulated by continuing debates regarding suchissues as the appropriate model for conceptualizing psychological illness and health;

who or what needs 'treating'; the specific and general mechanisms for affecting changes; and the quantifications prerequisite for the practice of the ever-multiplying forms of psychosocial treatment." (6,

The psychotherapies attempt to effect changes in thought, mood, and behavior through verbal and symbolic techniques brought about by a professional relationship between a socially sanctioned healer and a suffering person. Research findings in psychotherapy on the outcome of treatment and variables affecting the outcome can be summarized as follows:

... Most forms of psychotherapy are effective with about two-thirds of nonpsychotic patients. About 10 percent of treated patients become worse.

... Controlled research has been notably successful in demonstrating that treated patients show significantly more behavioral and attitude change than untreated patients.

... Any seeming differential effectiveness of various forms of psychotherapy gradually disappear with the passage of time. It has yet to be convincingly demonstrated that one form of psychotherapy is superior to another.

... The spontaneous remission rate is far lower than the 72 percent widely believed. It must be calibrated for each homogeneous patient population treated.

... Patients who benefit from psychotherapy are those who experience acute discomfort because of their condition and are highly motivated to receive treatment and expect to be helped by it. They show a high degree of personal integration, and intelligent and reasonably well-educated, have achieved some social success, are reflective, and are able to experience and express emotion.

... The therapist-patient interaction is a mutual influence process. The patient may seriously limit or enhance the therapist's ability to function in the manner he believes to be useful; similarly, the therapist's behavior may limit or enhance the patient's ability or willingness to deal with his or her problems.

Within the last decade, there has been a proliferation of new psychosocial

treatment techniques. They include transcendental meditation, encounter groups and other techniques of the human growth movement, primal therapy, reevaluative counseling, the Arica Institute system, and others. Research on these methods has been relatively neglected - in part, at least, because the avant garde practitioners do not apply for research support and because competent investigators rarely can obtain the cooperation of practitioners. One notable exception was a study of 10 different group approaches. Here the investigators found about a third of the participants in the group benefiting, another third remaining unchanged, and the remaining third having a negative outcome. In this latter group, about 9 percent suffered serious damage.

A second exception was work supported by NIMH on transcendental meditation. One study found that meditation induced relaxation, accompanied by physiological changes differing from those during sleep and hypnotic trance. According to a survey of college student, consistent use of this technique was associated with less use of drugs.

Behavior therapy is differentiated from other forms of psychosocial treatment in that its philosophy and techniques are derived principally from laboratory research on classical and operant conditioning. A wide range of specific interventions has been developed to alter observable 'maladaptive' behavior and to manipulate systematically the conditions believed to evoke or maintain such behavior. The principal results of research on behavior therapy include:

... Systemativ desensitization has been reported to be highly effective with most phobic and anxiety reactions, but to be somewhat less effective with obsessive-compulsive behavior, hysteria, encopresis, psychological impotence, frigidity, homosexuality, fetishes, transvestism, exhibitionism, gambling, obesity, insomnia, and nightmares.

... Operant conditioning principles have been successfully applied for the modification of such behavior problems as temper tantrums, head banging, thumb-

sucking, and refusal to eat.

... Forms of reinforcement therapy, or operant conditioning, have been successfully applied in institutions to alter verbal and nonverbal behavior of psychotic adults and autistic children. The techniques have also be adapted to natural community settings - the home, school, half-way house, community agency - to deal with a wide range of problems, such as 'excessive verbal demands', rebellious behavior, sibling rivalry, hyperactivity, isolate behavior, difficulties in relationships with peers, and classroom disruptions.

Somatic therapy treatment approaches are based on the belief that psychological conditions can be influenced therapeutically by nonpsychological methods. These approaches include chemical, hormonal, and physical interventions that directly or indirectly affect the nervous system and produce changes in thought, mood, and behavior.

Before the discovery of psychotropic drugs, available psychoactive chemicals primarily aided the hospital management, rather than the treatment of patients with schizophrenia or disabling depressions. Today, most schizophrenics and people suffering serious affective disorders can be quickly returned to their families or cared for in halfway houses or foster homes. Consequently the focus has shifted from concern with terminating acute or chronic psychotic episodes to concern with prophylaxis, reduction of the side-effects of prolonged chemotherapy, and problems of maintaining the individual as an effectively functioning member of the community.

Psychotropic drugs do not provide a cure for psychoses, but they do appear to interrupt the psychotic episode and to ameliorate symptoms. Drugs also offer a sugnificant prophylaxis by preventing the recurrence of symptoms that in the past resulted in frequent rehospitalization. Since the time of the first psychotropic drugs, chlorpromazine and rauwolfia, thousands of others have been synthesized for treating the psychopatholoy associated with schizophrenia, depression,

and manic-depressive psychosis. Under NIMH sponsorship, a nationwide network of Early Clinical Drug Evaluation Units has been established to search for new drug treatment.

Findings on somatic treatment other than drugs are summarized below:

.."Electroconvulsive therapy is most effective and the most rapid-acting treatment for the relief of symptoms of the depressed stages of manic-depressive psychoses and involutional melancholia.

.. Electroconvulsive therapy has doubtful usefulness in treating character disorders, psychoneuroses, and schizophrenia in the absence of severe superimposed depressions.

.. Research in megavitamin or orthmolecular therapy has consistently failed to support the claims of its advocates. Reports of the effectiveness of this treatment appear to be based on studies that are scientifically inadequate."(7)

In Summary:

The past 30 years has seen expanded mental health research. It has been marked by a number of trends which have produced significant advances in knowledge. Such trends have included:

... A shift away from oversimplified theories about the development of mental illness. The importance of the interaction of biological, psychological, and sociocultural factors has generally been recognized.

... Striking biological advances have been achieved. These have included: (1) evidence that genetic factors play an important role in schizophrenia and depressive illness, and (2) discovery that certain pharmacological agents will exacerbate and others ameliorate those disorders. These drugs affect neurotransmission.

... Major development in psychological and sociocultural research have included: (1) methodological advances in quantifying observations and judgements of symptoms and behavior; (2) demonstration that the prevalence of schizophrenia

is highest in the lowest social classes of larger cities; (3) an increasing emphasis on long-term studies, particularly of children at high risk to psychosis, to learn what factors contribute to the development of mental illness; (4) progress in the field of learning behavior, which has made major contributions to the understanding and treatment of mental disorders; and (5) a focus on the family as a contributor to the development of mental disorders.

* * * * * * * * * * *

The possibility that mental illness need not persist for life began to be acknowledged very slowly. Only toward the end of the nineteenth century did scientific psychiatry begin. With its new concepts came the possibility of medical intervention, of amelioration and perhaps cure, introducing hope for the millions of people who are in some way affected.

Today, people all over the world are being affected by the conviction that mental illness, like physical illness, has causes that can be explored, understood, and ultimately corrected. Because a medical model of emotional and behavioral disorders has become increasingly accepted, it is possible for disturbed people to seek help rather than resign themselves to misery. Although mental health research can hardly be expected to cure all the problems generated by society, it can help lay bare the inner structure of such problems and thus indicate the directions of amelioration and prevention.

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